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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/754,559	01/12/2004	Shibly S. Ahmed	H1420	8208

7590 07/29/2005
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EXAMINER

LE, THAO P

ART UNIT	PAPER NUMBER
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2818

DATE MAILED: 07/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/754,559

Applicant(s)

AHMED ET AL.

Examiner

Thao P. Le

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 May 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 16-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 5 pages.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claims 1-20 are pending.

Election/Restriction

Applicant's election **with traverse** of claims **1-10, 16-20** is acknowledged.

Because Applicant did not distinctly and specifically point out the supposed error in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). Applicants have the right to file a divisional, continuation or continuation-in-part application covering the subject matter of the non-elected claims.

Information Disclosure Statement

Information Disclosure Statement (IDS) filed on and after the mailing of the application is acknowledged. The references cited on the PTOL 1449 forms have been considered.

Claim Objection

Claim 7 is objected to because of the following:

In claim 7, the first "crystalline" material is not disclosed in the independent claim 1 in which dependent claim 7 depends on. Claim 7 should be amended to omit "crystalline" or claim 1 should be amended to add "crystalline" in between "first" and "material".

Claim Rejections

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-10, 16-20 are provisional rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1-16 of U.S. Patent Application Serial No. 10/754,540 also U.S. Pub Serial No. 2005/0153485. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 1-16 of U.S. Patent Application Serial No. 10/754,540

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contains all limitations cited in claims 1-10 and 16-20 of present application, including forming a fin, source/drain regions, forming a dummy gate over the fin, forming dielectric around the dummy gate ("around" is similar to adjacent to the dummy gate), forming a trench and forming a metal gate within the trench.

Claims 1-10, 16-20 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 8-19 of U.S. Patent No. 6,855,989 and claims 1-19 of U.S. Patent No. 6,855,583. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 8-19 of U.S. Patent No. 6,855,989 and claims 1-19 of U.S. Patent No. 6,855,583 contain all limitations cited in claims 1-10 and 16-20 of present application.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 5-6, 16 are rejected under 35 USC 102 (b) as being anticipated by Yu, U.S. Patent No. 6,406,951.

Regarding claims 1, 16, Yu discloses a method of forming a finFET comprising
(See Figs. 1-15 and Cols. 1-10):

Forming a fin 216 (Figs. 4-5);

Forming a source region adjacent a first end of the fin and a drain region
adjacent a second end of the fin (222/224, Fig. 7);

Forming a dummy gate oxide 214 comprising a first material in a first
pattern over the fin (Figs. 5-6);

Forming a dielectric layer adjacent sides of the dummy gate (Figs. 7-12);

Planarizing the dielectric layer to expose a top surface of the dummy gate;

Removing the first material to form a trench 226 in the dielectric layer
corresponding to the first pattern (Fig. 8);

Forming a gate insulation layer 228 in the trench (fig. 10);

Forming a metal gate 232 in the trench.

Regarding claim 5, Yu discloses forming a gate insulation layer 228 in the trench
prior to forming the metal gate.

Regarding claim 6, Yu discloses wherein the gate insulation layer comprises
silicon oxide (30-35, Col. 5).

Claims 1-4, 7-10, 16-20 are rejected under 35 USC 102 (e) as being anticipated by Yu, U.S. Patent No. 6,764,884.

Regarding claims 1, 16, Yu discloses a method of forming a finFET comprising (See Figs. 1-8 and Cols. 1-10):

Forming a fin 210 (Fig. 2A);

Forming a source region adjacent a first end of the fin and a drain region adjacent a second end of the fin (220/230, Fig. 2B);

Forming a dummy gate 300 comprising a first material in a first pattern over the fin (Figs. 3A-3B);

Forming a dielectric layer 610 adjacent sides of the dummy gate (Figs. 7A-7B);

Planarizing the dielectric layer to expose a top surface of the dummy gate;

Removing the first material to form a trench 810 in the dielectric layer corresponding to the first pattern (Fig. 8);

Forming a gate insulation layer 1140 in the trench (fig. 11D);

Forming a metal gate 1010.

Regarding claims 2-3, 17-18, Yu discloses wherein the FinFET comprises a tri-gate fin and the metal gate contacts at least three surfaces of the fin (Fig. 10B).

Regarding claims 4, 19, Yu discloses wherein the dielectric layer comprises tetraethylorthosilicate (lines 60-62, Col. 4).

Regarding claims 7, 20, Yu discloses wherein the first material comprises polysilicon.

Regarding claim 8, Yu discloses forming a dummy oxide 140 over the fin prior to forming the dummy gate 310.

Regarding claim 9, Yu discloses wherein forming the dummy gate comprises depositing a layer of the first material over the fin and etching the layer of the first material to form the dummy gate in the first pattern (Figs. 1-3B).

Regarding claim 10, Yu discloses wherein forming the metal gate comprises depositing a metal material to fill the trench (figs 8-10).

When responding to the office action, Applicants' are advice to provide the examiner with the line numbers and page numbers in the application and/or references cited to assist the examiner to locate the appropriate paragraphs.

A shortened statutory period for response to this action is set to expire 3 (three) months and 0 (zero) day from the day of this letter. Failure to respond within the period for response will cause the application to become abandoned (see M.P.E.P 710.02(b)).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thao P. Le whose telephone number is 571-272-1785. The examiner can normally be reached on M-T (7-6).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on 571-272-1787. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Thao P. Le', with a stylized, cursive script.

Thao P. Le

Examiner

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